

Remarks

The above-referenced application has been reviewed in light of the Examiner's Final Office Action dated May 11, 2006. Claims 1, 4, 7, 12, 16, 18 and 22 have been amended. No new matter has been added. Accordingly, Claims 1-23 are currently pending in this application. The Examiner's reconsideration of the rejections is respectfully requested, particularly in view of the above amendments and the following remarks.

In accordance with the Office Action, Claims 7-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over United States Pre-Grant Pub. 2002/0006226 to Shiota in view of United States Patent No. 5,497,430 to Sadovnik et al.

Amended Claim 7 recites, *inter alia*, a "system for appearance-based object detection ... comprising ... a detection unit responsive to an input image, which input image has a different brightness and contrast than the trained images, for simultaneously solving for intensity normalization and detecting objects corresponding to the trained images by adding a scaling and a shift to image intensity with a projection equation". Since the claims are interpreted in light of the specification, the amendment to Claim 7 is offered to emphasize a feature already inherent in this claim (see, e.g., Application at page 4, lines 2-5). Thus, no new issues have been raised.

The Shiota publication is generally directed towards removing a shade from a portion of an image using principle component analysis, where the shade

may be a shadow cast by or on a face, for example (see Shiota at Abstract).

Thus, Shiota may address removal of a shade component cast by another component in the image.

Shiota fails to address differences in overall image intensity between training and input images. That is, Shiota is not directed towards “brightness and contrast normalization” of an entire image, but merely addresses removal of a shadow component from a portion of an image. Thus, Applicants maintain their argument that the Examiner’s interpretation of Shiota as addressing intensity normalization of an entire input image relative to a training set, when Shiota merely addresses shadow component removal within an image, is unreasonable and should not be maintained.

In addition, Shiota fails to contemplate, much less teach or suggest “simultaneously solving for intensity normalization and detecting objects corresponding to the trained images by adding a scaling and a shift to image intensity with a projection equation”, as recited in amended Claim 7. Applicants’ recognized this drawback of the prior art in their disclosure as originally filed (see, e.g., Application at page 3, line 23 through page 4, line 7).

The ‘430 to Sadovnik et al. is generally directed towards a neural network for image recognition (see Sadovnik at Abstract). Sadovnik’s teachings for a neural network are inapposite to Shiota’s teachings for principle component analysis. Thus, one of ordinary skill in the pertinent art at the time of Applicants’ invention would not have been motivated to combine the teachings of Sadovnik

with those of Shiota. Moreover, the resulting combination would be unworkable since the eigenvectors used in Shiota's principle component analysis are incompatible with the automatically weighted nodes of Sadovnik's neural network.

In addition, even if the combination of Shiota's method for removing a shade from an image using principle component analysis were to be combined with Sadovnik's shifting and scaling, said combination would not only fail to teach or suggest that the intensity normalization and detection are performed simultaneously, but would make simultaneous performance impossible due to the pre-programmed weightings of Sadovnik's network nodes.

Therefore, the Shiota publication in view of the '430 patent to Sadovnik et al. fail to teach or suggest all features of Applicants' currently amended Claim 7, whether taken alone or in combination with any of the other references of record in this case.

In accordance with the Office Action, Claims 1, 3-4, 10-12, 14-15, 18 and 20-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shiota in view of Sadovnik et al., in further view of United States Patent No. 6,711,293 to Lowe. Claims 1, 7, 12 and 18 have been amended.

Amended Claim 1 recites, *inter alia*, a "method for brightness and contrast normalization in appearance-based object detection, the method comprising ... forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity

normalization parameters". Since the claims are interpreted in light of the specification, the amendment to Claim 1 is offered to emphasize a feature already inherent in this claim (see, e.g., Application at page 4, lines 2-5). Thus, no new issues have been raised.

The above discussion with respect to deficiencies of Shiota in view of Sadovnik is similarly applicable here. For example, Shiota in view of Sadovnik fail to teach or suggest "appearance-based object detection ... comprising ... finding eigenimages corresponding to the training images ... forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters" as recited in amended Claim 1.

The '293 to Lowe is generally directed towards scale-invariant object detection within an image. Lowe fails to recognize, much less address or cure the above-described deficiencies of Shiota in view of Sadovnik, particularly with respect to "detection ... comprising ... forming a projection ... by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters" as recited in amended Claim 1.

Thus, Lowe fails to cure at least the above-described deficiencies of Shiota in view of Sadovnik with respect to amended Claim 1, as well as with respect to amended Claims 7, 12 and 18 which each recite similar language. Therefore, amended Claims 1, 7, 12 and 18 are neither taught nor suggested by Shiota in view of Sadovnik in further view of Lowe, whether taken alone or in

further combination with any of the other references of record in this case.

In accordance with the Office Action, Claims 5-6, 16-17 and 22-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shiota in view of Waters et al. *Super Resolution and Image Enhancement Using Novelty Concepts*, further in view of Sadovnik. Claims 5, 16 and 22 have been amended.

Amended Claim 5 recites, *inter alia*, a “method as defined in Claim 1, further comprising forming eigenimages for multiresolution ... wherein the pseudo-eigenimages are formed with a projection equation responsive to the coarse eigenimages by adding a scaling and a shift to image intensity”. Since the claims are interpreted in light of the specification, the amendment to Claim 5 is offered to emphasize a feature already inherent in this claim (see, e.g., Application at page 1, line 28 through page 2, line 2). Thus, no new issues have been raised.

The above discussions with respect to deficiencies of Shiota in view of Sadovnik are similarly applicable here. As above, Shiota in view of Sadovnik fail to teach or suggest “appearance-based object detection ... comprising ... finding eigenimages corresponding to the training images ... forming a projection equation responsive to the eigenimages by adding a scaling and a shift to image intensity and simultaneously solving for intensity normalization parameters” as recited in amended Claim 1, from which amended Claim 5 depends.

Waters et al. is generally directed towards multi-resolution imaging by detecting novel changes in a fixed but arbitrary sensor pointing direction, where

the novel changes are merely changes that have not occurred before in that pointing direction. It shall be understood that the fixed pointing direction of Waters is a limitation neither taught in Applicants' specification nor required by Applicants' presently claimed invention.

Thus, Waters et al. fail to cure at least the above-described deficiencies of Shiota in view of Sadovnik. Therefore, amended Claim 5, as well as amended Claims 16 and 22 that recite similar features, are neither taught nor suggested by Shiota in view of Waters in further view of Sadovnik, nor by any of the other references of record in this case.

Conclusion:

Accordingly, it is respectfully submitted that amended independent Claims 1, 7, 12 and 18 are in condition for allowance for at least the reasons stated above. Since the remaining dependent claims each depend from one of the above claims and necessarily include each of the elements and limitations thereof, it is respectfully submitted that these claims are also in condition for allowance for at least the reasons stated, as well as for reciting additional patentable subject matter. All issues raised by the Examiner having been addressed, reconsideration of the rejections and an early and favorable allowance of this case are earnestly solicited.

Respectfully submitted,

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